Sox10 directs neural stem cells toward the oligodendrocyte lineage by decreasing Suppressor of Fused expression.

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Public Summary:
Oligodendrocyte precursor cells (OPCs) are lineage-restricted progenitors generally limited in vivo to producing oligodendrocytes. Mechanisms controlling genesis of OPCs are of interest because of their importance in myelin development and their potential for regenerative therapies in multiple sclerosis and dysmyelinating syndromes. We show here that the SoxE transcription factors (comprising Sox8, 9, and 10) induce multipotent neural precursor cells (NPCs) from the early postnatal subventricular zone (SVZ) to become OPCs in an autonomous manner. We performed a chromatin immunoprecipitation-based bioinformatic screen and identified Suppressor of Fused (Sufu) as a direct target of repression by Sox10. In vitro, overexpression of Sufu blocked OPC production, whereas RNAi-mediated inhibition augmented OPC production. Furthermore, mice heterozygous for Sufu have increased numbers of OPCs in the telencephalon during development. We conclude that Sox10 acts to restrict the potential of NPCs toward the oligodendrocyte lineage in part by regulating the expression of Sufu.

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